

Marsala involves a pumped liquid cooling system using cold plates 18 to absorb heat and discharge, in most cases, a two-phase mixture of liquid and vapor refrigerant to a vapor/liquid separator 24. Unevaporated refrigerant is separated from the vapor and each phase may be treated separately within the system. See col. 3, lines 34-53. Marsala is also discussed in Applicant's specification beginning at p. 2, line 25. As noted in the specification, Applicant submits that Marsala does not anticipate the use of a local condenser, instead using a vertically disposed vapor/liquid separator to separate the vapor for return to a remotely positioned condenser. As noted by Applicant in the specification, the gravity-based separation aspect of Marsala is problematic for non-vertical orientations of the separator.

Conversely, Applicant's approach in various embodiments of the present invention is to condense a two-phase coolant locally. Claim 1 recites a local condenser disposed proximate the evaporator. As discussed in greater detail in Applicant's specification in the first and last paragraphs on page 7, a local condenser can provide a high degree of control of the coolant flow independent of gravity effects of, for example, an inverted test head. This approach is substantially different than Marsala, which appears to use the vapor/liquid separator instead of a condenser to address such gravity-induced difficulties. While Marsala requires separate vapor and liquid paths, Applicant's local condenser enables Applicant to use a single path and provide a high degree of control of the coolant flow, regardless of an orientation of the cooling system relative to gravity. In view of the above remarks, Applicant submits that claim 1 is not anticipated by Marsala.

With reference to claim 4, Applicant submits that Marsala does not teach the use of a single-phase coolant path disposed in parallel with the evaporator and condenser. See Figure 4, for example.

Applicant submits that claims 2-4 are also patentable at least by way of their dependency from claim 1.

Claim 5 is not anticipated by Marsala at least because Marsala does not teach the step of routing a condensed single-phase liquid coolant off an electronic assembly. It appears that Marsala teaches the use of a cold plate 18 to absorb heat, with a discharge of a two-phase refrigerant to a vertical vapor-liquid separator. See col. 3, lines 43-51. Because Marsala does not teach routing a condensed single-phase liquid coolant off an electronic assembly, it cannot anticipate claim 5.

Claim 6 is patentable at least by way of its dependency from claim 5.

Claim 7 is not anticipated by Marsala at least because Marsala does not teach means for condensing disposed on an electronic assembly. See the discussion above.

Claim 9 is not anticipated by Marsala at least because Marsala does not teach a single-phase coolant path disposed in parallel with the evaporator, coupled to the evaporator outlet to mix sufficient single-phase coolant with the two-phase coolant and condense the two-phase coolant to a single-phase coolant. See Figure 6, for example.

Claims 8 and 9 are patentable at least by way of their dependency from claim 7.

Claim 10 is not anticipated by Marsala at least because Marsala does not teach means for routing a condensed single-phase liquid coolant off the electronic assembly. See the discussion above.

Claims 11-15 are patentable at least by way of their dependency from claim 10.

Claim 16 is not anticipated by Marsala at least because Marsala does not teach a local condenser, as discussed above in relation to claim 1.

With reference to claim 19, Applicant submits that Marsala does not teach the use of a single-phase coolant path disposed in parallel with each evaporator and condenser. See Figure 4, for example.

Claims 17-19 are also patentable at least by way of their dependency from claim 16.

CONCLUSION

In view of the remarks set forth above, it is respectfully submitted that this application is in condition for allowance. Accordingly, allowance is requested.

No extension fee is believed due. However, if an extension of time is needed in this case, please treat this paper as such. Authorization is hereby given to charge deposit account 50-0369

in connection with any fees or extension of time or any other fee that may be necessary to permit entry of this response.

Respectfully submitted,

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